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<120> MALATHION CARBOXYLESTERASE

<130> Attorney Docket No. 50179-051

<140> 09/068,960

<141> 1998-06-20

<150> PCT/AU96/00746

<151> 1996-11-22

<150> AU 6751

<151> 1995-11-23

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<170> PatentIn Ver. 2.0

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aatgtgcgca actttgggtg caatcccgat aatattacag tctttgggtga aagtgccggg 660
gctgcctcta cccactacat gatgttaacc gaacaaactc gcgggtcttt ccacgtggg 720
ataactaatg cgggtaatgc tatttgtcca ttggctaata cccaatgtca acatcggtgc 780
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<210> 10

<211> 570

<212> PRT

<213> *Lucilia cuprina*

<400> 10

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Cys Ile Glu Asn Lys Phe Leu Asn Tyr Arg Leu Thr Thr Asn Glu Thr
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Val Val Ala Glu Thr Glu Tyr Gly Lys Val Lys Gly Val Lys Arg Leu
35 40 45

Thr Val Tyr Asp Asp Ser Tyr Tyr Ser Phe Glu Gly Ile Pro Tyr Ala
50 55 60

Gln Pro Pro Val Gly Glu Leu Arg Phe Lys Ala Pro Gln Arg Pro Thr
65 70 75 80

Pro Trp Asp Gly Val Arg Asp Cys Cys Asn His Lys Asp Lys Ser Val
85 90 95

Gln Val Asp Phe Ile Thr Gly Lys Val Cys Gly Ser Glu Asp Cys Leu
100 105 110

Tyr Leu Ser Val Tyr Thr Asn Asn Leu Asn Pro Glu Thr Lys Arg Pro
115 120 125

Val Leu Val Tyr Ile His Gly Gly Gly Phe Ile Ile Gly Glu Asn His
130 135 140

Arg Asp Met Tyr Gly Pro Asp Tyr Phe Ile Lys Lys Asp Val Val Leu
145 150 155 160

Ile Asn Ile Gln Tyr Arg Leu Gly Ala Leu Gly Phe Leu Ser Leu Asn
165 170 175

Ser Glu Asp Leu Asn Val Pro Gly Asn Ala Gly Leu Lys Asp Gln Val
180 185 190

Met Ala Leu Arg Trp Ile Lys Asn Asn Cys Ala Asn Phe Gly Gly Asn
195 200 205

Pro Asp Asn Ile Thr Val Phe Gly Glu Ser Ala Gly Ala Ala Ser Thr
210 215 220

His Tyr Met Met Leu Thr Glu Gln Thr Arg Gly Leu Phe His Arg Gly
225 230 235 240

Ile Leu Met Ser Gly Asn Ala Ile Cys Pro Leu Ala Asn Thr Gln Cys
245 250 255

Gln His Arg Ala Phe Thr Leu Ala Lys Leu Ala Gly Tyr Lys Gly Glu
260 265 270

Asp Asn Asp Lys Asp Val Leu Glu Phe Leu Met Lys Ala Lys Pro Gln
275 280 285

Asp Leu Ile Lys Leu Glu Glu Lys Val Leu Thr Leu Glu Glu Arg Thr
290 295 300

Asn Lys Val Met Phe Pro Phe Gly Pro Thr Val Glu Pro Tyr Gln Thr
305 310 315 320

Ala Asp Cys Val Leu Pro Lys His Pro Arg Glu Met Val Lys Thr Ala
325 330 335

Trp Gly Asn Ser Ile Pro Thr Met Met Gly Asn Thr Ser Tyr Glu Gly
340 345 350

Leu Phe Phe Thr Ser Ile Leu Lys Gln Met Pro Met Leu Val Lys Glu
355 360 365

Leu Glu Thr Cys Val Asn Phe Val Pro Ser Glu Leu Ala Asp Ala Glu
370 375 380

Arg Thr Ala Pro Glu Thr Leu Glu Met Gly Ala Lys Ile Lys Lys Ala
385 390 395 400

His Val Thr Gly Glu Thr Pro Thr Ala Asp Asn Phe Met Asp Leu Cys
405 410 415

Ser His Ile Tyr Phe Trp Phe Pro Met His Arg Leu Leu Gln Leu Arg
420 425 430

Phe Asn His Thr Ser Gly Thr Pro Val Tyr Leu Tyr Arg Phe Asp Phe
435 440 445

Asp Ser Glu Asp Leu Ile Asn Pro Tyr Arg Ile Met Arg Ser Gly Arg
450 455 460

Gly Val Lys Gly Val Ser His Ala Asp Glu Leu Thr Tyr Phe Phe Trp
 465 470 475 480
 Asn Gln Leu Ala Lys Arg Met Pro Lys Glu Ser Arg Glu Tyr Lys Thr
 485 490 495
 Ile Glu Arg Met Thr Gly Ile Trp Ile Gln Phe Ala Thr Thr Gly Asn
 500 505 510
 Pro Tyr Ser Asn Glu Ile Glu Gly Met Glu Asn Val Ser Trp Asp Pro
 515 520 525
 Ile Lys Lys Ser Asp Glu Val Tyr Lys Cys Leu Asn Ile Ser Asp Glu
 530 535 540
 Leu Lys Met Ile Asp Val Pro Glu Met Asp Lys Ile Lys Gln Trp Glu
 545 550 555 560
 Ser Met Phe Glu Lys His Arg Asp Leu Phe
 565 570

<210> 11
 <211> 26
 <212> DNA
 <213> *Lucilia cuprina*

<400> 11
 atgaatttca acgttagttt gatgga 26

<210> 12
 <211> 28
 <212> DNA
 <213> *Lucilia cuprina*

<400> 12
 ctaaaataaaa tctctatggt tttcaaac 28

<210> 13
 <211> 570
 <212> PRT
 <213> *Musca domestica*

<400> 13
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 Cys Met Val Asn Lys Tyr Thr Asn Tyr Arg Leu Ser Thr Asn Glu Thr
 20 25 30
 Gln Ile Ile Asp Thr Glu Tyr Gly Gln Ile Lys Gly Val Lys Arg Met
 35 40 45
 Thr Val Tyr Asp Asp Ser Tyr Tyr Ser Phe Glu Ser Ile Pro Tyr Ala
 50 55 60
 Lys Pro Pro Val Gly Glu Leu Arg Phe Lys Ala Pro Gln Arg Pro Val
 65 70 75 80

Pro Trp Glu Gly Val Arg Asp Cys Cys Gly Pro Ala Asn Arg Ser Val
 85 90 95
 Gln Thr Asp Phe Ile Ser Gly Lys Pro Thr Gly Ser Glu Asp Cys Leu
 100 105 110
 Tyr Leu Asn Val Tyr Thr Asn Asp Leu Asn Pro Asp Lys Arg Arg Pro
 115 120 125
 Val Met Val Phe Ile His Gly Gly Asp Phe Ile Phe Gly Glu Ala Asn
 130 135 140
 Arg Asn Trp Phe Gly Pro Asp Tyr Phe Met Lys Lys Pro Val Val Leu
 145 150 155 160
 Val Thr Val Gln Tyr Arg Leu Gly Val Leu Gly Phe Leu Ser Leu Lys
 165 170 175
 Ser Glu Asn Leu Asn Val Pro Gly Asn Ala Gly Leu Lys Asp Gln Val
 180 185 190
 Met Ala Leu Arg Trp Val Lys Ser Asn Ile Ala Ile Phe Gly Gly Asp
 195 200 205
 Val Asp Asn Ile Thr Val Phe Gly Glu Ser Ala Gly Gly Ala Ser Thr
 210 215 220
 His Tyr Met Met Ile Thr Glu Gln Thr Arg Gly Leu Phe His Arg Gly
 225 230 235 240
 Ile Met Met Ser Gly Asn Ser Met Cys Ser Trp Ala Ser Thr Glu Cys
 245 250 255
 Gln Ser Arg Ala Leu Thr Met Ala Lys Arg Val Gly Tyr Lys Gly Glu
 260 265 270
 Asp Asn Glu Lys Asp Ile Leu Glu Phe Leu Met Lys Ala Asn Pro Tyr
 275 280 285
 Asp Leu Ile Lys Glu Glu Pro Gln Val Leu Thr Pro Glu Arg Met Gln
 290 295 300
 Asn Lys Val Met Phe Pro Phe Gly Pro Thr Val Glu Pro Tyr Gln Thr
 305 310 315 320
 Ala Asp Cys Val Val Pro Lys Pro Ile Arg Glu Met Val Lys Ser Ala
 325 330 335
 Trp Gly Asn Ser Ile Pro Thr Leu Ile Gly Asn Thr Ser Tyr Glu Gly
 340 345 350
 Leu Leu Ser Lys Ser Val Ala Lys Gln Tyr Pro Glu Val Val Lys Glu
 355 360 365
 Leu Glu Ser Cys Val Asn Tyr Val Pro Trp Glu Leu Ala Asp Ser Glu
 370 375 380

Arg Ser Ala Pro Glu Thr Leu Glu Arg Ala Ala Ile Val Lys Lys Ala
385 390 395 400

His Val Asp Gly Glu Thr Pro Thr Leu Asp Asn Phe Met Glu Leu Cys
405 410 415

Ser Tyr Phe Tyr Phe Leu Phe Pro Met His Arg Phe Leu Gln Leu Arg
420 425 430

Phe Asn His Thr Ala Gly Thr Pro Ile Tyr Leu Tyr Arg Phe Asp Phe
435 440 445

Asp Ser Glu Glu Ile Ile Asn Pro Tyr Arg Ile Met Arg Phe Gly Arg
450 455 460

Gly Val Lys Gly Val Ser His Ala Asp Glu Leu Thr Tyr Leu Phe Trp
465 470 475 480

Asn Ile Leu Ser Lys Arg Leu Pro Lys Glu Ser Arg Glu Tyr Lys Thr
485 490 495

Ile Glu Arg Met Val Gly Ile Trp Thr Glu Phe Ala Thr Thr Gly Lys
500 505 510

Pro Tyr Ser Asn Asp Ile Ala Gly Met Glu Asn Leu Thr Trp Asp Pro
515 520 525

Ile Lys Lys Ser Asp Asp Val Tyr Lys Cys Leu Asn Ile Gly Asp Glu
530 535 540

Leu Lys Val Met Asp Leu Pro Glu Met Asp Lys Ile Lys Gln Gly Ala
545 550 555 560

Ser Ile Phe Asp Lys Lys Lys Glu Leu Phe
565 570

<210> 14

<211> 1710

<212> DNA

<213> Musca domestica

<400> 14

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caaattaagg gtgttaagcg aatgaccgtc tacgatgatt cttactacag tttcgagagt 180
ataccctatg ctaagcctcc agtgggtgag ttgagattca aggcacccca gcggcctgta 240
ccatgggagg gtgtacgtga ttgctgtggg ccagccaaca gatcgggtaca gacagatttc 300
ataagtggca aaccacacagg ttcgaggat tgtctatacc tgaatgtgta taccaatgac 360
ttgaaccag acaaaaggcg tctgttatg gttttcatcc atggcggaga ttttattttc 420
ggcgaagcaa atcgtaactg gtttggtccc gactacttta tgaagaaacc cgtggtcttg 480
gtaaccgtgc aatatcgttt ggggtgtgtt ggtttcctta gcctgaaatc ggaaaatctc 540
aatgtccccg gcaacgctgg cctcaaggat caagtaatgg ccttgagatg ggtcaagagt 600
aatattgcc aatttcggtg cgatgtagac aatattaccg tcttcggcga aagtgtgtgt 660
ggggcctcaa cccattacat gatgataacc gaacagaccc gtggtttatt ccatcgtggt 720
atcatgatgt ccggtaatc catgtgctca tgggcctcta cagaatgcc aagtcgtgctg 780
ctcaccatgg ccaaacgtgt tggctataag ggagaggaca atgaaaaaga tatcctggaa 840
ttcctaataa aagccaatcc ctatgatttg atcaaagagg agccacaagt tttgacaccc 900

gaaagaatgc aaaataaggt catgtttcct tttggacca ctgtagaacc ataccagaca 960
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 caatatccgg aggttgtaaa agagttggaa tcctgtgtga attatgtgcc ttgggagttg 1140
 gctgacagtg aacgcagtgc cccggaaacc ctggagaggg ctgccattgt gaaaaaggcc 1200
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<210> 15

<211> 207

<212> PRT

<213> Musca domestica

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 20 25 30

Val Met Val Phe Ile His Gly Gly Gly Phe Ile Phe Gly Glu Ala Asn
 35 40 45

Arg Asn Trp Tyr Gly Pro Asp Tyr Phe Met Lys Lys Pro Val Val Leu
 50 55 60

Val Thr Val Gln Tyr Arg Leu Gly Val Leu Gly Phe Leu Ser Leu Lys
 65 70 75 80

Ser Glu Asn Leu Asn Val Pro Gly Asn Ala Gly Leu Lys Asp Gln Val
 85 90 95

Met Ala Leu Arg Trp Phe Lys Ser Asn Ile Ala Ile Phe Gly Gly Asp
 100 105 110

Val Asp Asn Ile Thr Val Phe Gly Glu Ser Ala Gly Gly Ala Ser Thr
 115 120 125

His Tyr Met Met Ile Thr Glu Gln Thr Arg Gly Leu Phe His Arg Gly
 130 135 140

Ile Met Met Ser Gly Asn Ser Met Cys Ser Ser Ala Ser Thr Glu Cys
 145 150 155 160

Gln Ser Arg Ala Leu Thr Met Ala Lys Arg Val Gly Tyr Lys Gly Glu
 165 170 175

Glu Asn Glu Lys Asp Ile Leu Glu Phe Leu Met Lys Ala Asn Pro Tyr
 180 185 190

Asp Leu Ile Lys Glu Glu Pro Gln Val Leu Thr Pro Glu Arg Met

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 <213> *Lucilia cuprina*

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<210> 18
 <211> 21
 <212> DNA
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<400> 18
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<210> 19
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<400> 19
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<210> 20
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<400> 20
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<210> 21
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<400> 21
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<210> 22
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<210> 23
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<400> 23
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<210> 24
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<400> 24
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<210> 25
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<400> 25
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<400> 26
tatcagctgt tgggtgtttct c 21

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<400> 27
acgcgattct ttaggcatac g 21

<210> 28
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<213> Lucilia cuprina

<400> 28
tgctgcctct acccactaca t 21

<210> 29
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<400> 29
cctgtggctt ggctttcata a 21

<210> 30

<211> 35
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Primer

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<223> i

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<223> i

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<221> modified_base
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<223> i

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<223> i

<400> 30
ttcgagggna tncntaygc nmarccnccn btngg

35

<210> 31
<211> 32
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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Degenerate
Primer

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<221> modified_base
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<223> i

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<400> 31

acytgrtcyt tnarncngc rttncnggn ac

32

<210> 32

<211> 22

<212> DNA

<213> Musca domestica

<400> 32

tttggtcccg actactttat ga

22

<210> 33

<211> 24

<212> DNA

<213> Musca domestica

<400> 33

tgccacttat gaaatctgtc tgta

24

<210> 34

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<212> DNA

<213> Musca domestica

<400> 34

tacatgatga taaccgaaca gacc

24

<210> 35

<211> 23

<212> DNA

<213> Musca domestica

<400> 35

tcgattatgtt gggtttcatt tgt

23

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<211> 21

<212> DNA

<213> Musca domestica

<400> 36

acagacagat ttcataagtg g 21

<210> 37

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<400> 37

tttgattct ttcgggtgtc a 21

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<400> 38

attcgatacc cacattgata g 21

<210> 39

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atgacttttc tgaagcaatt cat 23

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<213> Musca domestica

<400> 41

aaacaattcc ttctttttat cga 23

<210> 42

<211> 21

<212> DNA

<213> Musca domestica

<400> 42

ggcatggaaa acctcacctg g 21

<210> 43

<211> 207

<212> PRT

<213> Lucilia cuprina

<400> 43

Gln Val Asp Phe Ile Thr Gly Lys Val Cys Gly Ser Glu Asp Cys Leu

1

5

10

15

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Val	Leu	Val	Tyr	Ile	His	Gly	Gly	Gly	Phe	Ile	Ile	Gly	Glu	Asn	His	35	40	45	
Arg	Asp	Met	Tyr	Gly	Pro	Asp	Tyr	Phe	Ile	Lys	Lys	Asp	Val	Val	Leu	50	55	60	
Ile	Asn	Ile	Gln	Tyr	Arg	Leu	Gly	Ala	Leu	Gly	Phe	Leu	Ser	Leu	Asn	65	70	75	80
Ser	Glu	Asp	Leu	Asn	Val	Pro	Gly	Asn	Ala	Gly	Leu	Lys	Asp	Gln	Val	85	90	95	
Met	Ala	Leu	Arg	Trp	Ile	Lys	Asn	Asn	Cys	Ala	Asn	Phe	Gly	Gly	Asn	100	105	110	
Pro	Asp	Asn	Ile	Thr	Val	Phe	Gly	Glu	Ser	Ala	Gly	Ala	Ala	Ser	Thr	115	120	125	
His	Tyr	Met	Met	Leu	Thr	Glu	Gln	Thr	Arg	Gly	Leu	Phe	His	Arg	Gly	130	135	140	
Ile	Leu	Met	Ser	Gly	Asn	Ala	Ile	Cys	Pro	Leu	Ala	Asn	Thr	Gln	Cys	145	150	155	160
Gln	His	Arg	Ala	Phe	Thr	Leu	Ala	Lys	Leu	Ala	Gly	Tyr	Lys	Gly	Glu	165	170	175	
Asp	Asn	Asp	Lys	Asp	Val	Leu	Glu	Phe	Leu	Met	Lys	Ala	Lys	Pro	Gln	180	185	190	
Asp	Leu	Ile	Lys	Leu	Glu	Glu	Lys	Val	Leu	Thr	Leu	Glu	Glu	Arg	195	200	205		